Name: Date:

Polynomial Factoring solution (version 48)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 4x + 15 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(15)}}{2(1)}$$

$$x = \frac{-(4) \pm \sqrt{16 - 60}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{-44}}{2}$$

$$x = \frac{-4 \pm \sqrt{-4 \cdot 11}}{2}$$

$$x = \frac{-4 \pm 2\sqrt{11}\, i}{2}$$

$$x = -2 \pm \sqrt{11}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-8 + 3i$ and $4 - 5i$ in standard form $(a + bi)$.**

Solution

$$(-8 + 3i) \cdot (4 - 5i)$$

$$-32 + 40i + 12i - 15i^2$$

$$-32 + 40i + 12i + 15$$

$$-32 + 15 + 40i + 12i$$

$$-17 + 52i$$

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3. **Write function $f(x) = x^3 - 7x^2 - 6x + 72$ in factored form. I'll give you a hint: one factor is $(x + 3)$.**

Solution

	1	-7	-6	72
-3		-3	30	-72
	1	-10	24	0

$$f(x) = (x + 3)(x^2 - 10x + 24)$$

$$f(x) = (x + 3)(x - 6)(x - 4)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 7) \cdot (x + 2)^2 \cdot (x - 1)$$

Sketch a graph of polynomial $y = p(x)$.